

**RELATIONSHIP BETWEEN TEACHERS' QUALITY AND STUDENTS'
ACHIEVEMENT IN BIOLOGY IN OVIA NORTH EAST LOCAL
GOVERNMENT AREA**

BY

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**DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY
FACULTY OF EDUCATION
UNIVERSITY OF BENIN**

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**A RESEARCH SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND
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CERTIFICATION

We the undersigned, certify that this work was carried out by ADE MARVELLOUS PRECIOUS in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin City.

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DEDICATION

This project is dedicated to God Almighty, the author and finisher of my success, for his protection, provision, peace and abiding favour throughout the duration of my studies and I pray he continue doing so.

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ABSTRACT

This study was carried out to identify the Assessment of teacher's quality on students' academic achievement in Biology. The research was carried out as a survey research using relevant literature from journals, magazines, books, and the internet. Four research questions were raised and analyzed for the purpose of the study. A random sampling technique was used in the selection of 20 Biology teachers who were randomly selected SS1 students in senior secondary school students in Ovia North East LGA, Benin City Edo State. The data were collected with a questionnaire instrument and analyzed using simple percentages. The result revealed that; there were fewer teachers with good quality in the schools of study, there were more female teachers with good quality than males, and there were more teachers with good quality in public schools, from the study, 8 teachers representing 71% of the population affirmed that teachers with good quality breed students' achievement in biology while 12 of the teachers think otherwise. Based on the results, it was recommended that school heads should ensure that the potential of the teachers is well harnessed and utilized to reflect the true picture of their quality in the academic achievement of students, teachers must wake up to their responsibilities and be dedicated to their subjects and duties in the classroom because the poor performance of students will always be referred to their failure in their designated duties, the government through the inspectorate division must routinely visit schools to ensure that teachers are qualified and are properly discharging their primary assignment, teachers should be motivated to participate actively in in-service training programmes and workshops to update their knowledge and pedagogical skills.

CHAPTER ONE

INTRODUCTION

Background to the Study

Education is an essential and indispensable part of human life (Aggarwal, 2017). It is therefore, a constitutional right, matter of self-interest and moral principle for a child to receive good quality education. Education needs to be reinforced throughout life because the nation depends on it for a competitive work force and cohesive citizenry (Hettleman, 2017). It has positive impact on human life and the level of educational attainment helps individuals to earn respect and recognition. Teachers are the most important factor in students' learning, yet little is known about the specialized knowledge held by experienced teachers. In recent years, discourse on teachers' content knowledge (TCK), pedagogy knowledge (TPK), and pedagogical content knowledge (TPCK) on students' learning outcomes have attracted increasing attention from several agents of change in the education industry.

Biology is a unique branch of natural sciences, however, like other natural sciences; it is concerned with the search for in-depth understanding of natural phenomena and events. It is composed of two major fields, functional biology and historical biology, which is also, known as evolutionary biology. (Frilov, 2014; Mayr, 2014). The functional processes of biology deal with physiological processes in living things and it can be explained with the natural laws of physical sciences, especially at the cellular-molecular level. The most frequent question asked in functional biology field is how? In the field of historical biology, a sound knowledge of history is needed for the explanation of all aspects of the living world that have to do with the dimension of historical time. Experiments are sometimes inappropriate to provide answers to the why and how questions that are frequently and occasionally asked respectively in this field of biology.

Effective teaching and learning of Biology cannot occur without congenial classroom environment. Teachers maintain positive and effective learning environment through well-prepared and varied lessons, which cater for the range of student abilities and interests. It also involves, setting of realistic and challenging academic standards of student performance.

Teachers are required to demonstrate commitment to teacher professional development through interest and attendance at appropriate in-service courses, commitment to a programme of professional study.

Several indices are used to measure the quality of a Biology teacher. Each teacher quality index provides a single measure of teacher quality based on a larger number of teacher quality measures, such as teacher's experience, certification status, academic ability and even stability at school. Although there is ongoing debate about whether objective measures of teacher quality (such as experience, certification status, quality of the preparation and teacher stability) accurately identify teacher effectiveness in improving student achievement, recent research has found statistically significant relationships between these objective measures of quality and gains in student achievement.

The success or failure in the process of teaching a particular concept in Biology lies in the pedagogical approach adopted by the teacher, without which the teaching would appear to the students as what Hiebert (2018) had noted that the deficiencies of traditional approach which is a contrast to the pedagogical knowledge. An actual teaching should not only contain the

teacher's skillful demonstration of his/her knowledge but should also include the ability to guide the students to understand meaningfully the content of the knowledge. This shows the importance of PCK in instruction of any classroom. Recent research in science subjects pointed towards teachers' pedagogical content knowledge (PCK) as one of the most influential factors contributing to students' learning and achievement Gess-Newsome, (2016). It can be assumed that higher levels of PCK allow teachers to devise learning environments that challenge, and at the same time support students' learning processes, with highly knowledgeable teachers being able to anticipate students' difficulties and adaptively respond when students encounter problems.

Pedagogical knowledge relates to 'how' the educator would teach a subject Gess-Newsome, (2017). Gess- Newsome added that, it might include an awareness of student misconceptions or the naïve theories that they bring to the subject when they are first learning about it. It might also be assessment of which concepts can be taught at which grade levels or to which students. The third area is contextual knowledge. The contextual knowledge domain consists of the broader knowledge such as knowledge of

the scientific method and how it is relevant to the lesson. If content knowledge is “what is being taught”, pedagogical knowledge is “how it is being taught”.

Communication is a very important skill which means the written and oral transmission of common understanding. It is a skill that is critical to success in every field, but it is crucial to teachers who must achieve results through the behavioural changes exhibited by learners. Effective communication involves the most accurate sending and receiving of information, full comprehension of the message by both parties and appropriate action taken upon the completion of the information exchange (Terry and Franklin, 2015).

In the classroom setting, all these meanings are relevant and descriptive of what takes place in the teaching and learning process. For instance, teachers’ thoughts and content are first prepared as a written message in the note of lesson, and presented to the student through verbal and non-verbal means. He expects a feedback as he evaluates the students on the learning objectives. This description of the teachers’ job summarises the act, art and process of communication. The act implies the delivered

message, art, the skills of presentation and the process, the various stages in communication.

In view of the above, and in order to improve teacher quality, efforts should be made to provide adequate and functional educational services for teachers. These services include the provision of library services, distance learning programmes, in-service training, teachers' resource centres services, and the promotion of information and communication technology. These services tend to facilitate the implementation of the educational policy, the attainment of policy goals and the promotion of effectiveness of the educational system (FRN, 2004).

Statement of the Problem

Since one of the purposes of education is acquisition of knowledge and skills, students' performance after graduation can be seen as a reflection of their performance in school. This also borders on the quality of human and material resources which are available during their schooling. For many years, educators and researchers have debated on which school variables influence students' achievement. As policy-makers become more involved in school reform, greater attention is given to the role teacher quality plays

in terms of PCK, classroom management and good communication skill and students' achievement. The government has stated that no education system can rise above the quality of its teachers (Federal Republic of Nigeria, 2004).

Although several attempts have been made at improving teacher quality, communication and teaching skills, these efforts have not been proportionately reflected in students' overall performance. Rather, such attempts have only sustained the highly bookish curriculum inherited from the colonial masters and made the educational system consumptive rather than productive (Jimoh, 2018). Could it be that teachers do not acquire enough skills to make them relevant technologically? Or there are no educational services and proper utilization to students' academic performance cannot be overemphasized or the ineffectiveness of teachers in classroom interaction with the students could be responsible for the observed poor performance of students and the widely acclaimed fallen standard of education in Nigeria. The need to investigate an Assessment of teacher's quality on students' academic achievement in Biology had become essential.

Purpose of Study

The purpose of this study is to carry out an Assessment of teacher's quality on students' academic achievement in Biology. Specifically, the study intends to:

1. Determine the secondary school biology teachers' quality in Ovia North East Local Government Area, Benin city, Edo State.
2. Determine the difference in quality between male and female biology teachers.
3. Determine the difference in quality between biology teachers of public and private schools.
4. Identify the relationship between teachers' quality and students' achievement in biology.

Research Questions.

The following research questions have been formulated to guide the study.

1. What are secondary school biology teachers' quality in Ovia North East local Government Area, Benin city, Edo State?

2. Is there a difference in quality between male and female biology teachers?
3. Is there a difference in quality between biology teachers of public and private schools?
4. Is there a relationship between teachers' quality and students' achievement in biology?

Significance of the Study

It is hoped that the results of the study will assist teachers to develop new learning experiences for the students and to reorganize these learning experiences in ways enough to arouse the interest of the students. It would be helpful if teachers were to improve on teaching methods and communication skills and its adequate use, modern and relevant instructional materials and textbooks at their disposed to the fullest.

Finally, the government and parents would benefit from the study of their roles as highlighted in the recommendation column.

Scope and delimitation of the Study

The scope of the study is to carry out an Assessment of teacher's quality on students' academic achievement in Biology. The study will determine the influence of teacher quality on students' academic

performance, the relationship between teachers' communication skills and the academic performance of students and ways of improving teacher's quality and communication skill. The study is therefore limited to senior secondary school students of private and public schools, in ovia North East Local Government Area, Benin city, Edo state.

Operational Definition of Terms

Academic Achievement: The response of students to set objectives in a particular subject. Usually a result of an evaluation or examination based on particular syllabus in Biology.

Communication skill: Ability to express data/information. The proficiency with which a person exhibits the passing of information from one person/medium to another.

Teacher quality: This means a degree of excellence, especially a high degree of goodness and worth of the teachers. In this study, teacher quality refers to teachers' pedagogical knowledge, classroom management, and communication skills in Biology.

School ownership: This can be schools owned by Government or by private individuals

Sex: either male or female biology student.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter focuses on the review of related literature. And it will be discussed under the following sub-headings:

- Conceptual Framework
- The Factors that Determine Biology Teachers' Quality
- Relationship Between Teachers' Quality and Students' Achievement in Biology
- The Difference in Male and Female Teachers' Quality and Students' Achievement in Biology
- Difference in Teachers' Quality and Students' Achievement based on School Ownership
- Empirical review
- Summary of Reviewed Literature

Conceptual Framework

According to the Lexicon Webster's dictionary (2017), quality is a grade, a degree of excellence, especially a high degree of goodness or worth. Therefore, quality can be said to be an agreed level of goods and services. Muriel (2015) opined that quality concept is based on the premise that

people will take a greater interest in and improve the productivity of their work if they can become more involved in the decision-making process.

In this way the workers improve both their self-image and their working environment. In the same vein, Oakland (2019) posited that “quality is the totality of features and characteristics of a product of service that bear on its ability to satisfy stated or implied needs”. Quality can then be said to mark a level of acceptance or satisfied excellence of teaching/learning process in the school. Ejiofor and Aniagoh (2014) explained that “the quality of personnel determines the products and services they render; no organization can rise above the quality of its staff; without personnel, all other factors of production will remain in their natural untapped state”.

According to John (2013), “teacher education in Nigeria is conditioned by historical and social factors”. Like in most countries of the world, the provision of adequate facilities and finance for teacher education has lagged behind the provision of similar inputs in other fields of education. The issue of supply and demand of teachers, according to John (2013), stated that next to students, teachers are the largest, most extensive and

crucial inputs of an educational system. In the light of this, there should be production of high quality teachers who have good academic knowledge of their subject disciplines and who possess professional skills, experience, administrative responsibility, attitudes and values as well as personal qualities for effective teaching.

It is believed that the more experienced a teacher is the more productive he will be in his teaching and the more likely his students will perform more brilliantly academically in school examinations than those students taught by an inexperienced teacher. Oakland (2019) opined that “the success of any educational enterprise depends solely upon the quality of teachers employed to run the instructional programmes in the school system”. Their duties and functions which determine their quality vary widely. It is also of importance to note that their functions dictate the size, rules, policies and the general organization of their institutions. No wonder the Federal Government decided that teachers’ education be given a major emphasis in all educational planning because “no education system can rise above the quality of its teachers” (FRN 2004).

In the same vein, Obanya (2013) opined that like the case in any other area of human activity, a teacher should have both natural and acquired characteristics to be able to perform satisfactorily. Natural qualities are traits which the typical teacher is born with, while acquired characteristics are, in addition to natural traits, those that come through learning. The teacher needs to develop his human and academic qualities which will make him/her a better teacher, such as personality qualities, physical energy, perseverance, responsibility, initiative, self-control, decisiveness, humour, sincerity, loyalty, leadership and academic qualities.

Academic ability includes intelligence, subject-matter knowledge, knowledge of teaching and learning, teaching experience and certification status and vigour to carry out research. Supporting the above assertion, Majasan (2015) stressed that a teacher is expected to have the following qualities for effective teaching and learning to take place: Initiative, patience, sympathy, respect, flexibility, honesty, foresight, intellectual curiosity and keenness. These are the qualities normal and special that a teacher requires meeting for the classroom performances in order to produce the well-

integrated individual capable of playing significant roles in the school setting.

Darling-Hammond and Hudson, (2018) buttressed the above statement further when they stated that “one way to measure the quality of teachers is to look at their certification, teaching experience, academic responsibility and attitudes towards teaching”. Teaching quality is determined by the teacher’s overall performance as well as teaching practices. The quality of education of any nation to a very large extent determines the development status of the particular nation. Education can be regarded as the heartbeat of any nation. As a man nourishes his heart to be alive, a nation must also cater for her educational system in order to keep it alive technologically, economically, politically and socially and to also ensure quality products (graduates). The Nigerian Philosophy of Education and the National Educational goals implicitly aim at the production of quality graduates (FRN, 2004). The attainment of these goals can only be realized by providing quality instruction for students.

The importance of teacher quality is also noted by the National Academics (2007) in Web information on its study of Teacher Preparation

Programme: “Teacher quality is widely recognized by policy-makers, practitioners and researchers alike to be the most powerful school-related influence on a child’s academic performance. In the United States, many empirical studies have been conducted to identify the characteristics of teacher quality that are associated with higher student achievement. Several syntheses of these studies have identified teacher certification, subjectmatter, knowledge, pedagogical knowledge and teaching experience as significantly associated with higher student achievement or greater achievement gains (Darling-Hammond and Youngs, 2012).

Teachers are important and make a difference. The quality of teaching is a crucial factor in promoting effective learning in schools. Teaching is an art in the sense that teachers, like painters, composers, actresses and dancers, make judgment based largely on qualities that unfold during the course of action. Qualitative forms of intelligence are used to select, control and organize classroom qualities such as tempo, tone, climate, pace of discussion and forward movement. The teacher must ‘read’ the emerging qualities and respond with qualities appropriate to the ends sought or the direction he or she wishes the students to take.

The Factors that Determine Biology Teachers' Quality

A teacher is a person whose occupation is teaching others especially children. A teacher is also someone who instructs others or provides activities, materials and guidance that facilitate learning in either formal or informal situation. Per Ighohiro (2012), teachers are those who mold student character, personality and show students the right direction to success. Ryan and Cooper (1998) explain that a teacher must demonstrate a repertoire of teaching skills that are believed to facilitate students learning and must display attitudes that foster learning and genuine human relationship. They emphasize that teachers are required to make many decisions as they plan for instruction, implement teaching strategies, and evaluate outcome of their planning and strategies.

Teachers are the main determinants of quality in education and are expected to be effective and committed. Hanushek and Rivkin, (2004) describe effective teachers as consistently obtaining good results from students, while ineffective teachers produce low learning growth. Therefore, according to Richard (2002), a quality teacher is said to be an effective teacher. Studies, such as Richard (2002) and Ferguson (1991) focused on

investigating total teacher effectiveness revealed that in a single school year, students who were assigned to an effective teacher could gain a full grade level more than those students who were assigned to an ineffective teacher. Therefore, their studies' observations defined quality teachers in a way that is of most interest to student achievement gain which is the main aim of education. This is also affirmed in Nigeria's National Policy on Education (2006) that no educational system can rise above the quality of the teachers in the system. In other words, the quality of teachers in an educational system determines the quality of the system because teachers are policy implementers.

Good teaching is at the heart of good schooling. Therefore, the quality of teacher preparation is crucial to helping students reach high academic standards. Yet many enter the profession unprepared, having received poor-quality training. Some teachers, who are working without a regular teaching license, may never have received any training. To provide quality education for all students, teacher quality practices in schools should be of a high standard as teachers are the key to quality education.

According to Gidado (2010) the quality of biology teachers can be influenced by several factors. Here are some key factors that can determine the quality of biology teachers.

Knowledge and expertise: A biology teacher's depth of knowledge and expertise in the subject matter is crucial. They should have a strong understanding of the fundamental concepts, current research, and developments in the field of biology. Continuous learning and staying updated with the latest advancements are important for providing accurate and relevant information to students.

Educational qualifications: A biology teacher should possess appropriate educational qualifications, such as a bachelor's or master's degree in biology or a related field. Higher degrees or specialized certifications can indicate a deeper understanding of the subject matter and enhance their teaching abilities.

Teaching methods and strategies: Effective biology teachers employ various teaching methods and strategies to engage students and facilitate learning. They should be able to explain complex concepts in a clear and understandable manner, use visual aids, conduct hands-on experiments,

encourage critical thinking, and promote active student participation. Adaptability to different learning styles and the ability to cater to individual student needs also contribute to the quality of teaching.

Communication skills: Strong communication skills are essential for biology teachers to effectively convey information and interact with students. They should be able to articulate ideas clearly, listen actively, encourage discussions, answer questions, and provide constructive feedback. Effective communication also involves fostering a positive and inclusive classroom environment.

Classroom management: good classroom management skills are crucial for maintaining a productive and disciplined learning environment. Effective biology teachers establish clear expectations, enforce rules consistently, manage time efficiently, and address disciplinary issues promptly. They should also be able to handle diverse student populations and create a safe and respectful atmosphere for all students.

Passion and enthusiasm: A high-quality biology teacher is often characterized by their passion and enthusiasm for the subject. Their genuine love for biology can inspire and motivate students to develop an interest in

the subject. Enthusiastic teachers tend to be more dedicated, creative, and willing to go the extra mile to ensure students' understanding and success.

Professional development: Continuous professional development is essential for biology teachers to improve their teaching skills and stay updated with advancements in the field. Engaging in professional development activities such as attending workshops, conferences, and seminars, pursuing additional certifications, and participating in collaborative learning communities can significantly enhance a teacher's quality.

Assessment and feedback: Effective biology teachers design appropriate assessments to evaluate students' understanding and progress. They provide timely and constructive feedback to guide students' learning and help them improve. Regular assessment and feedback help teachers identify areas where students may be struggling and adjust their teaching accordingly.

Student outcomes: The success of a biology teacher can also be measured by the outcomes of their students. High-quality teachers are often associated with positive student outcomes, such as improved grades, increased interest

and engagement in biology, and continued pursuit of the subject at higher levels of education.

In general, the competent teacher should have, and continually develop, the knowledge and skills in learning technologies to be able to appropriately and responsibly use tools, resources, processes, and systems to retrieve, assess and evaluate information from various media. The competent teacher should use that knowledge and skills to assist learners in solving problems, communicating clearly, making informed decisions, and constructing new knowledge, products, or systems in diverse, engaged learning environments.

Relationship Between Teachers' Quality and Students' Achievement in Biology

Secondary education is a very critical level of any educational system. This is because it is the bedrock on which higher education is built, as the foundation of whatever a child wants to become in life academically is laid here. Therefore, those saddled with the responsibility of imparting knowledge at this level of education system must possess certain qualities. One of the most important qualities for a teacher to have is knowledge. A

good teacher should understand the central concepts and have an understanding of the subject that he teaches and be able to demonstrate vast knowledge of the subject matter. Knowledge enables teachers to approach head-on the topics at hand and bring their talents to bear. Even among the international community, there is an assumed meaning of the term teacher quality. Few have attempted to define its meaning.

While some view teacher quality as comprising the training and the attributes of the teacher, others take a more holistic view. The latter group considers teacher quality as including the training and continuous professional development of the teacher, student outcomes, the working environment in which the teacher operates including learning resources, and other support the teacher receives including school management and leadership, and teacher remuneration. While there may be debates about the term, there are some areas of agreement about what constitutes teacher quality and what makes for effective classroom practice.

Teacher Quality is most important school-based factor for student achievement, Daniel in Daso (2013) said that quality teachers have greater

influence on students achievement than any other school-based factor and further suggested that how every nation educates its teachers will largely determine the degree to which it succeeds in the 21st century knowledge driven economy. The classroom is a vehicle for conveying students based on their status from the point they enter the school to where they need to be progressively. Classroom organization is the meticulous arrangement of furniture, materials, displays and other fixed elements in the classroom; such that both teachers and students can interact most effectively in the course of teaching and learning. The classroom environment is influenced by the guidelines established for its operations, its users, and its physical elements.

Effective teachers expertly manage and organize the classroom and expect their students to contribute in a positive and productive manner. Communication is the sharing of information between two or more persons i.e Communication is a “two-way process of convergence”, in which information is shared by both parties and mutually beneficial relationships are established between individuals or groups. The survival and growth of any organization depends on having effective communication system.

A good teacher must be aware of other ways of communicating with his/her students, apart from the verbal and written communication. Gestures can be used with or without verbal communication. A fixed glance on a student will stop him/her from doing something wrong, in the same way that a smile or a wink will serve as a congratulatory remark for a good performance (Sng Bee, 2012). The issue of poor academic performance of students in Nigeria has been of much concern to all and sundry. Several accusing fingers are pointed at teachers for being responsible for the fallen standard of education. Some studies suggest that the quality of education depends on the teachers effectiveness expressed and reflected in the performance of their duties. Overtime pupils' academic performance in both internal and external examinations had been used to determine excellence in teachers and teaching (Ajao 2011). Critical to teacher's effectiveness however is the communication skill at his disposal.

In the classroom setting, all these meanings are relevant and descriptive of what takes place in the teaching and learning process. For instance, teachers' thoughts and content are first prepared as a written message in the note of lesson and presented to the student through verbal

and nonverbal means. He expects a feedback as he evaluates the students on the learning objectives. This description of the teachers' job summarises the act, art and process of communication. The act implies the delivered message, art, the skills of presentation and the process, the various stages in communication.

Teachers' Communication skills have been tipped to have an important influence on students' academic achievement and at the same time play a crucial role in educational attainment of the students. This is because the teacher is ultimately responsible for translating policy into action and principles based on practice during interaction with the students (Afe 2011). Both teaching and learning depend on teachers and their ability to communicate subject matter without so much confusion for the students: no wonder an effective teacher has been conceptualized as one who produces desired results in the course of his duty as a teacher (Uchefuna 2011).

The entire communication process involves a sender who transmits a message and a receiver who usually reacts. At times there are interferences between transmission reception and all these take place within an environment. Pat and Tyler (2018) explored the phases of communication.

He explained that the first stage in the process of communication is the decision made by the sender to communicate fast. Sometimes one is unconscious for instance when pricked by pain, it could be as a result of careful thinking or some external stimulus. This idea will make little or no sense to anyone even the sender himself.

The Difference in Male and Female Teachers' Quality and Students' Achievement in Biology

The quality of teaching and students' achievement in biology is not inherently linked to the gender of the teacher. Both male and female teachers are capable of providing high-quality education and fostering student achievement in the subject. Numerous factors influence the effectiveness of teaching and students' achievement, such as the teacher's knowledge, experience, teaching methods, communication skills, and their ability to engage students in the learning process. These factors are not determined by gender but by individual qualities and professional development.

Teacher characteristics in this study are those attributes, characters and behaviors exhibited by teachers in the classroom and during teaching and learning process. The prevailing conditions of these factors would definitely have a negative or positive influence on the instructional quality in schools, which may translate to either good or poor academic achievement of Secondary school students (Ibe, 2015). However, the big question is: Do our secondary school teachers of Biology in Nigeria possess educational qualification? Why has our students' achievement in Biology been persistently reported low?

Biology is a practical-oriented course that needs appropriate qualification and experiences to teach. Teachers must have these basic requirements for teaching to enable them respond effectively to the growing challenges of societal changing demands. Wikipedia (2014) defines teacher education as the policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviours and skills they require to perform their tasks effectively in the classroom. According to Osuji (2009) teacher education refers to professional education of teachers towards attainment of attitudes, skills and knowledge considered desirable so as to

make them efficient and effective in their work in accordance with the need of a society. These enhance teaching quality and make the teaching of biology more dynamic and goal-oriented.

The Federal Government of Nigeria (FRN, 2004) clearly outlined the objectives of teacher training to include: producing highly motivated, conscientious and efficient classroom teachers for all levels of its educational system; to encourage further, the spirit of enquiry and creativity in teachers; to help teachers fit into social life of the community and the society at large; to enhance teachers commitment to national goals by providing them with the intellectual and professional background adequate for their assignment to help them adapt to changing situations, and to enhance their commitment to the teaching profession (Etiubon and Benson, 2014). Teacher training programme involve practices and methods that aim at promoting creativity and skill for professional qualification (Etiubon and Benson, 2014). It is also a fact that being a trained teacher does not guarantee effective teaching and learning of biology. Previous studies found conflicting results on teacher qualification and their level of teaching effectiveness in line with the curriculum requirements. For instance, Owoeye

(2000) observes that teacher's educational level was a powerful determinant of academic achievement of students.

There is no inherent difference in the quality of male and female teachers when it comes to their ability to teach biology or any other subject. Teaching effectiveness depends on a variety of factors, such as subject knowledge, pedagogical skills, classroom management, and the ability to engage and motivate students. These factors are not determined by gender but rather by the individual teacher's qualifications, experience, and teaching approach. Owoeye (2000).

Similarly, students' achievement in biology or any other subject is not inherently linked to the gender of their teachers. Academic success is influenced by various factors, including the quality of instruction, students' motivation and engagement, their prior knowledge and skills, family support, and overall school environment. Gender alone does not play a significant role in determining students' achievement in biology.

It's worth noting that diversity among teachers, including gender diversity, can bring different perspectives and experiences to the classroom, which can enhance students' learning experiences. Exposure to both male

and female role models in the field of biology can also help break down gender stereotypes and encourage students of all genders to pursue science-related careers. Ultimately, the quality of teaching and students' achievement in biology depend on multiple factors beyond the gender of the teacher. It's important to focus on promoting effective teaching practices, supporting student engagement, and creating inclusive learning environments for all students, regardless of the gender of their teachers.

Difference in Teachers' Quality and Students' Achievement based on School Ownership

A school is an educational institution designed to provide learning spaces and learning environments for the teaching of students under the direction of teachers. The great public benefits of education have historically prompted governments to assume the primary role in managing and funding schools. Recently, a growing interest in improving school quality, student outcomes, and a quest for greater school choice for parents and students, for more creativity and innovation in the schools, themselves, has challenged the notion of government's primacy in education (oecd, 2006; brewer and hentschke, 2009). This trend, emerging in a number of countries, is based on

the belief that the public interest in education can be better served by also involving private entities, including parents, non-governmental organizations and enterprises, in addition to government agencies, in managing and funding schools.

If certain types of schools have more resources or a better learning environment, students who attend these types of schools are more likely to perform better. Conversely, those students who attend schools with fewer resources for practicals and disruptive environments tend to perform poorly, which could ultimately limit their prospects in life (Woessmann et al., 2006; Wrinkle et al., 2009; Amanda & Marrazzo, 2010). In addition, as learning environments and gender play important roles not only in students' academic performance but also in their socialization in a broader sense, school ownership that are highly stratified along socio-economic lines could inadvertently undermine social cohesion. socio-economic stratification, as well as how students' educational experiences differ depending on whether they attend publicly or privately managed schools (OECD, 2016).

Privately managed schools may have the authority to hire and compensate teachers and staff, and thus can select better-prepared teachers

and introduce incentives for performance. Privately managed schools may also have more discretion on curricula and instructional methods, and so can adapt them to the interests and abilities of their students. The need to attract students means that privately managed schools must be more sensitive to parents' demands concerning curricula, teaching methods, facilities and discipline, and more responsive to students' needs (Ammermuller, 2015). Although public funding may create opportunities for those who could not afford tuition fee (Woessmann, 2009), it may reduce the pressure on schools to be accountable for student outcomes, since parents would be less likely to exert this pressure, given that they do not directly bear the cost of education in these schools.

The quality of teachers and students' achievement can vary based on the ownership of a school, which refers to whether the school is public or private. While it is important to note that there are exceptions and variations within each category, the following are some general differences that are often observed (Ammermuller, 2005):

1. Teachers' Quality:

Public Schools: Public schools typically hire teachers who have obtained a teaching certification or degree and are often required to meet specific educational standards set by the government or education authorities. These schools tend to have a structured hiring process and may prioritize qualifications and experience when selecting teachers. (Ammermuller, 2005).

Private Schools: Private schools have more flexibility in selecting their teachers. While many private schools also prefer certified teachers, they may have additional criteria or preferences that prioritize certain qualifications or teaching philosophies. Private schools often have smaller class sizes and may hire teachers with specialized expertise or experience in specific subjects or teaching methods. Overall, the quality of teachers can vary in both public and private schools, but public schools often have more standardized hiring processes and may have a larger pool of applicants due to the higher number of available teaching positions. (Ammermuller, 2005).

2. Students' Achievement:

Public Schools: Public schools serve a diverse student population and are generally open to all students within a specific geographical area. This can result in a wide range of academic abilities and backgrounds among students.

Public schools often have a responsibility to provide education to all students, regardless of their academic performance or socio-economic status. As a result, the overall student achievement in public schools can vary, and standardized test scores may reflect this diversity. (OECD, 2016)

Private Schools: Private schools often have more selective admission processes and may have specific academic or behavioral requirements for enrollment. They can be more exclusive and have the ability to set higher academic standards for their students. Additionally, private schools may provide more resources, smaller class sizes, and specialized programs that can contribute to higher student achievement levels. Private schools often have a reputation for higher standardized test scores and college placement rates. (OECD, 2016)

However, it is important to consider that the differences in students' achievement between public and private schools can also be influenced by various factors, such as funding, resources, parental involvement, and the overall learning environment. It is worth noting that these differences are generalizations, and individual schools may deviate from these patterns. Additionally, the quality of education and student achievement cannot be

solely attributed to school ownership but is influenced by a complex interplay of various factors including teacher quality, curriculum, school leadership, parental support, and community involvement. (OECD, 2016).

Empirical studies

Teacher quality is a crucial factor that affects school quality and student performance. Research consistently shows that highly qualified and experienced teachers are more effective in promoting student learning and academic achievement. In Indonesia, teacher quality has been identified as a significant challenge, with a shortage of qualified teachers in many schools (DarlingHammond, 2000; Sirait, 2016).

A study by (Mayasari et al., 2021; Rosdianti, 2013; Sauri & Hanafiah, 2022; Sobandi, 2010) examines the relationship between teacher quality and student achievement in junior high schools in Bandung. The study found a significant positive correlation between teacher quality and student performance, suggesting that more qualified teachers are more effective at promoting student learning.

Teacher characteristics, such as gender, age, and educational background, also affect school quality and student performance. Studies

have shown that teacher gender can affect students' academic performance, with some studies showing that female teachers are more effective at promoting learning outcomes than male teachers (Iranzo-García et al., 2020; Wayne & Youngs, 2003).

In a study by (Rathana & Sutarsih, 2015; Sobandi, 2010), examined the influence of teacher gender on student achievement in junior high schools in Bandung. The study found that female teachers were more effective at promoting student learning outcomes than male teachers, highlighting the importance of gender diversity in the teaching profession.

Teacher experience is another important factor that affects school quality and student performance. Research consistently shows that experienced teachers are more effective at promoting student learning outcomes than inexperienced teachers. However, the relationship between teacher experience and student performance may vary depending on the context. A study by (Sauri & Hanafiah, 2022; Sobandi, 2010) investigating the effect of teacher experience on student performance in high schools in Bandung. The study found that teacher experiences had a significant positive

impact on student performance, suggesting that more experienced teachers were more effective at promoting student learning outcomes.

The school and classroom climate also plays an important role in promoting school quality and student performance. A positive school and classroom climate can increase student motivation and engagement, leading to improved learning outcomes.

A study by (Reyes et al., 2012) investigated the influence of school and classroom climate on student performance. The study found that positive school and classroom climates have a significant positive impact on student performance, highlighting the importance of promoting a positive school and classroom environment to improve school quality and promote student learning outcomes.

Summary of Reviewed Literature

From the literature reviewed so far and on the basis of the conceptual framework examined, it can be seen that the quality of teachers to a large extent determines the quality of students. Evidence have shown that standard of education has fallen despite the huge sum of money the government has

invested in education. Examination malpractice, moral decadence and poor job performance are some of the indices of the poor standard of education in Nigerian secondary schools in general.

The review has shown that a lot of work has been done on quality control and quality assurance and how to maintain quality in the educational system. If a teacher is academically-sound, professionally competent, and possesses good character traits, he is expected to be able to discharge his duties effectively as a teacher.

These studies examined the various ways teacher quality can be maintained. Suggestions like on-the-job training for teachers as well as the provision of a conducive learning environment among others were made to aid learning. However, this study went a step further by examining the provision, utilization and maintenance of some educational services for teachers and students so that they will be exposed, dynamic, current, be able to think ahead, project and forecast for effective teaching and learning.

This study examined other means of improving teacher quality such as provision of educational services that will not only maintain teacher quality, but also put them on the track of quality and ensure a total transformation of

teachers so that they will be able to catch up with the rest of the world technologically, and make teaching and learning more exciting so as to improve the academic performance of students.

CHAPTER THREE

METHODOLOGY

This chapter describes the research methodology that was used in the study under the following sub-headings:

- Research Design
- Population of the Study
- Sample and Sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Administration of the Instrument
- Method of Data Analysis

Research Design

This study employed ex-post facto research method. The ex-post facto method is used to study and analyze variables that have already occurred naturally, without any manipulation or control by the researcher. In other words, it investigates the relationship between an independent variable (teacher quality) and a dependent variable (students' academic achievement in Biology) after the fact.

Population of the Study

The study population comprises all two thousand five hundred and fifty-three (2553) students studying Biology in ss1 both in private and government schools in Ovia North East LGA, Benin City Edo State. And 85 teachers both male and female teaching Biology in both private and government schools in Ovia North East LGA, Benin City Edo State.

Sample and Sampling Technique

The sample consists of eighty (80) students and twenty (20) biology teachers who would be randomly selected SS1 students in senior secondary school students in Ovia North East LGA, Benin City Edo State, were used after randomly selecting intact classes.

Research Instrument

The research instrument is a teacher questionnaire designed by the researcher entitled "Assessment of Teacher's Quality on Students' academic achievement in Biology". And a test instrument for students, It is divided into two sections: sections A and B. Section A contains particulars of the respondents (demographic data) such as name of class, age, gender while section while section B contains twenty items. The questions contained in the questionnaire revolves round the research questions raised in the chapter one of this study and the response obtained from the respondent will help to validate the research questions.

Validity of the Instrument

In order to ascertain the validity of the instrument, the questionnaire designed by the researcher would be given to the supervisor and two lecturers in the Department of Curriculum and Instructional Technology (CIT) to scrutinize and for necessary corrections to ensure content as well as face validity. Corrections made on the draft would be incorporated in the final draft.

Reliability of the Instrument

The reliability of the instrument is established using split-half technique. The data would be correlated using Spearman Brown's Correction Formulae. The reliability coefficient is expected to be found at 0.78. This indicates that the instrument would be adequate for the study.

Administration of Instrument

The questionnaire would be administered personally by the researcher to the respondent that was randomly selected from the sample students. The respondent would be assured of confidentiality and urged to answer the questions honestly in the best of their knowledge. Instructions would be given to the respondent on how to fill the questionnaire and the questionnaire would be collected the same day to avoid incident of loss.

Method of data analysis

The data collected was statistically analysed by the use of simple percentage in the following levels:

70% and above - Very High

60 - 69% - High

40 - 59% - Low

30% and Below - Very Low

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

This chapter involved the analysis of data and the presentation of results in the course of the research. The data are presented in tables and are arranged according to research questions.

Presentation of Results

SECTION A:

RQ1: What are secondary school biology teachers' quality in Ovia North East Local Government Area, Benin City, Edo State?

Table 1: Percentage analysis of secondary school biology teachers' quality

Variable	N	(%)	Remark
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	Quality		
Teachers with Good Quality	8	40	Low
Teachers with Bad Quality	12	60	High
TOTAL	20	100	

Researcher Fieldwork 2023

Table 1 shows that from the twenty (20) teachers used as the sample of the study, only 8 representing 40% of the population were Teachers with good quality, while twelve (12) representing 60% were teachers with bad quality. Table 1 therefore shows that there are fewer teachers with good quality in the schools of study.

RQ2: Is there a difference in quality between male and female biology teachers?

Table 2: Percentage analysis of secondary school biology teachers' quality based on sex

Variable	N	(%)	Remark
Male	3	37.5	Low
Female	5	62.5	High
TOTAL	8	100	

Researcher Fieldwork 2023

Table 2 shows that from the eight (8) teachers that were found to have good quality in Table 1, three (3) of them representing 37.5% were male, while

five (5) representing 62.5% were female. It hereby showed that there were more female teachers with good quality than males.

RQ3: Is there a difference in quality between biology teachers of public and private schools?

Table 3: Percentage analysis of secondary school biology teachers' quality based on ownership

Variable	N	(%)	Remark
Public school	5	62.5	High
Private school	3	37.5	Low
TOTAL	8	100	

Researcher Fieldwork 2023

Table 3 above shows that from the eight (8) teachers that were found to have good quality in Table 1, five (5) of them representing 62.5% were from

Public schools, while three (3) representing 37.5% were located in private schools. It hereby showed that there were more teachers with good quality in public schools.

RQ4: Is there a relationship between teachers' quality and students' achievement in biology?

Table 4: Percentage analysis of the relationship between teachers' quality and students' achievement in biology

Variable	N	(%)	Remark
		Quality	
Good	8	71	High
Poor	12	29	Low
TOTAL	20	100	

Researcher Fieldwork 2023

Table 4 shows that from the twenty (20) teachers used as the sample of the study, only 8 representing 71% of the population affirmed that teachers with

good quality breed students' achievement in biology while 12 of the teachers think otherwise

Discussions and Findings

The result of this study has been quite instructive, informative, and revealing. Based on the analysis of data or information collected from the opinion of the respondents on an Assessment of teacher's quality on students' academic achievement in Biology.

The analysis of research question one reveals that there are fewer teachers with good quality in the schools of study. According to (Adamsbazi, 2012) In general, the competent teacher should have, and continually develop, the knowledge and skills in learning technologies to be able to appropriately and responsibly use tools, resources, processes, and systems to retrieve, assess and evaluate information from various media. The competent

teacher should use that knowledge and skills to assist learners in solving problems, communicating clearly, making informed decisions, and constructing new knowledge, products, or systems in diverse, engaged learning environments.

The results of research question two show that there were more female teachers with good quality than males. The quality of teaching and students' achievement in biology is not inherently linked to the gender of the teacher. Both male and female teachers are capable of providing high-quality education and fostering student achievement in the subject. Numerous factors influence the effectiveness of teaching and students' achievement, such as the teacher's knowledge, experience, teaching methods, communication skills, and their ability to engage students in the learning process. These factors are not determined by gender but by individual qualities and professional development.

The results of research question three show that there were more teachers with good quality in public schools. If certain types of schools have more resources or a better learning environment, students who attend these types of schools are more likely to perform better. Conversely, those

students who attend schools with fewer resources for practicals and disruptive environments tend to perform poorly, which could ultimately limit their prospects in life (Woessmann et al., 2006; Wrinkle et al., 2009; Amanda & Marrazzo, 2010). In addition, as learning environments and gender play important roles not only in students' academic performance but also in their socialization in a broader sense, school ownership that are highly stratified along socio-economic lines could inadvertently undermine social cohesion. socio-economic stratification, as well as how students' educational experiences differ depending on whether they attend publicly or privately managed schools (OECD, 2016).

The results of research question four show that 8 representing 71% of the population affirmed that teachers with good quality breed students' achievement in biology while 12 of the teachers think otherwise. Teacher Quality is most important school-based factor for student achievement, Daniel in Daso (2013) said that quality teachers have greater influence on students achievement than any other school-based factor and further suggested that how every nation educates its teachers will largely determine the degree to which it succeeds in the 21st century knowledge driven

economy. The classroom is a vehicle for conveying students based on their status from the point they enter the school to where they need to be progressively. Classroom organization is the meticulous arrangement of furniture, materials, displays and other fixed elements in the classroom; such that both teachers and students can interact most effectively in the course of teaching and learning.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The purpose of this research was to find out an Assessment of teacher's quality on students' academic achievement in Biology. The researcher made efforts to analyze the Factors that Determine Biology Teachers' Quality, the relationship Between Teachers Quality and Students' Achievement in Biology, the Difference in Male and Female Teachers' Quality and Students' Achievement in Biology, the difference in Teachers'

Quality and Students' Achievement based on School Ownership. All of these have been discussed in detail in the literature review.

The collection of data was carried out through the administration of questionnaires to Biology teachers who were randomly selected SS1 students in senior secondary school students in Ovia North East LGA, Benin City Edo State. The data were analyzed, interpreted, and discussed using percentages and frequency tables. The sampling technique used for the research is stratified random. The findings of the study reveal that as follows:

Following the analysis of the data collected and findings were made:

1. There are fewer teachers with good quality in the schools of study.
2. There were more female teachers with good quality than males.
3. There were more teachers with good quality in public schools.
4. From the study, 8 teachers representing 71% of the population affirmed that teachers with good quality breed students' achievement in biology while 12 of the teachers think otherwise.

Conclusion

The teacher is the pivot of the education process. The teacher is the key to the entire education programme and s/he can make or mar the best educational programme in the world. Education therefore is what teachers make of it. Thus, competent, devoted, and professionally qualified teachers are essential foundations for a good education system. In other words, the attainment of national objectives for the adequate preparation of students for their examinations and achievement of educational objectives depends largely on teachers.

Recommendations

Based on the conclusion of the study, the following recommendations are made;

1. School heads should ensure that the potential of the teachers is well harnessed and utilized to reflect the true picture of their quality in the academic achievement of students.
2. Teachers must wake up to their responsibilities and be dedicated to their subjects and duties in the classroom because the poor

performance of students will always be referred to their failure in their designated duties.

3. The government through the inspectorate division must routinely visit schools to ensure that teachers are qualified and are properly discharging their primary assignment.
4. Teachers should be motivated to participate actively in in-service training programmes and workshops to update their knowledge and pedagogical skills.

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APPENDIX A

**DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL
TECHNOLOGY (CIT)**

FACULTY OF EDUCATION,

UNIVERSITY OF BENIN, BENIN CITY

**QUESTIONNAIRE ON THE RELATIONSHIP OF TEACHERS'
QUALITY ON STUDENTS' ACHIEVEMENT IN BIOLOGY IN OVIA
NORTH EAST LOCAL GOVERNMENT AREA.**

Dear Respondents,

Please respond sincerely to the questions by ticking [] where applicable. Your responses which are needed for research purposes only will be treated with high level of confidentiality. Thank you.

TEACHERS' DEMOGRAPHIC INFORMATION

Instructions: Please tick () where applicable.

1. Qualification: NCE () OND () HND () B.SC. () B.SC.ED () B.Ed (). Others specify. ()
2. sex: male () female ()
3. Years of Experience: 1-3 () above 3 years ()
4. School Ownership: Public () Private ()
5. Professionalism: Trained to teach () Not Trained to teach ()
6. Computer Literacy Certificate: Yes () No ()

Appendix B

SSI Questions On Cell Theory

1. Which of the following is the basic structural and functional unit of all living organisms? a) Tissue b) Organ c) Cell d) Organ system

2. The cell theory states that: a) All living things are composed of cells b) Cells are the smallest units of life c) Cells arise from pre-existing cells d) All of the above
3. Which scientist is credited with discovering cells using a simple microscope? a) Robert Hooke b) Louis Pasteur c) Anton van Leeuwenhoek d) Gregor Mendel
4. Prokaryotic cells are characterized by the absence of: a) Cell membrane b) Nucleus c) Cytoplasm d) DNA
5. Which organelle is responsible for the synthesis of proteins in the cell? a) Nucleus b) Mitochondria c) Ribosome d) Endoplasmic reticulum
6. Which cell organelle is responsible for packaging and distributing materials within the cell? a) Endoplasmic reticulum b) Golgi apparatus c) Nucleus d) Ribosome
7. Which type of cell is responsible for producing energy through photosynthesis? a) Neurons b) Muscle cells c) Plant cells d) Red blood cells
8. The process by which cells engulf external materials by forming a vesicle is called: a) Osmosis b) Diffusion c) Exocytosis d) Endocytosis

9. Which type of cellular transport requires energy to move substances against their concentration gradient? a) Diffusion b) Osmosis c) Active transport d) Passive transport
10. What is the function of the cell membrane? a) Regulate the passage of materials into and out of the cell b) Control cell division c) Store genetic information d) Convert sunlight into energy
11. Which of the following characteristics is common to all living things? a) Growth and development b) Inorganic composition c) Stationary behavior d) Artificial origin
12. The basic unit of life is the: a) Organism b) Cell c) Atom d) Tissue
13. Which of the following is NOT a characteristic of living things? a) Reproduction b) Homeostasis c) Metabolism d) Inanimate structure
14. Photosynthesis is a process carried out by: a) Animals b) Plants c) Fungi d) Bacteria
15. The process by which living organisms take in oxygen and release carbon dioxide is called: a) Fermentation b) Respiration c) Digestion d) Excretion
16. Which of the following characteristics is common to all living things? a) Growth and development b) Inorganic composition c) Stationary behavior d) Artificial origin

17. The basic unit of life is the: a) Organism b) Cell c) Atom d) Tissue
18. Which of the following is NOT a characteristic of living things? a) Reproduction b) Homeostasis c) Metabolism d) Inanimate structure
19. Photosynthesis is a process carried out by: a) Animals b) Plants c) Fungi d) Bacteria
20. The process by which living organisms take in oxygen and release carbon dioxide is called: a) Fermentation b) Respiration c) Digestion d) Excretion